



• PAARA NEWSLETTER •
VOLUME 46 • NUMBER 1 • January • 1997



PAARAgraphs

Since 1937

Newsletter for the **Palo Alto Amateur Radio Association, Inc.**



CALENDAR

January 1, 1997 **PAARA Dues,**

Mail to **PAARA** or give \$12 check, with Call, to:
Dave Bailey -WS6W, or Doug Schliebus -W6HXL, Treas.

January 3, **PAARA Meeting, 7:30**

Menlo Park Recreation Center
700 Alma Street, Menlo Park 7:30-9:30 PM

January 8, **PAARA Board Meeting, 7:30**

Red Cross Blvd. 400 Mitchell Ln., Palo Alto

January 9, ✕ **Winter Party** ✕ see page 5

February 7, **PAARA Meeting, 7:30**

February 12, **PAARA Board Meeting, 7:30**

'97 Dues \$12 envelope enclosed



Program

Jan 3, 1997, 7:30 P.M.

Speaker:?? Not confirmed at press time.

Check on NET Monday night before meeting.

PAARA Radio NET every Monday evening, at 8:30pm,
on the 145.230-600 repeater MHz, PL tone off. •



PRESIDENT'S PONDERINGS

de VIC BLACK, AB6SO

I'll use e-mail to inform members of program changes, late breaking news, meeting reminders and updates between PAARAgraphs publication dates. This is not required for you to keep informed, but is an additional service provided to club members with e-mail capabilities. But don't worry that we're becoming a computer club rather than a radio club. Is e-mail done by radio? No. But then neither are PAARAgraphs, QST, CQ or 73. E-mail is simply another means of communicating about ham radio (much like packet radio). Forward messages to anyone that may be interested in our club's activities.

Send your e-mail address to ab6so@smrn.com or add it to the attendance sheet at club meetings. I'll add you to the electronic mailing list. If you have a computer and modem, but no e-mail address, drop me a line or see me at club meetings for information on a FREE e-mail account.

If your Internet Service Provider allows access to the World Wide Web, you can get lots of information at the touch of a button. Web access is not available from free internet services. Costs are \$10 to \$20 per month for unlimited access. Monthly I'll list a couple of ham radio e-mail addresses or Web sites. These will include a short description of what you'll find to help you really enjoy ham radio. If you find something interesting, send the info to me and I'll

(Continued on page 4) Ponderings

Silent Key

Bill Wall, WA6YQX

Miscellaneous Dates

Flea Market at Foothill

will resume next March

PAARA Palo Alto Amateur Radio Association

meets 1st Friday 7:30 each month, Net 145.230 each Monday 8:30,
contact: Bill Rausch, AA6PA.....(408) 637-0622.

PAARA Auction, 2nd Saturday of October

contact Jerry Tucker, WA6LNV 415-961-3266

EMARC Electronics Museum Amateur Radio Club

Meets 4th Friday 7:30 each month,
contact Sheldon Edelman 415-858-2176.

NCDXC Northern California DX Club

Meets 2nd Friday each month, repeater for member info 147.360, each
Thursday 8:00PM, contact John Troster W6ISQ 415-854-3939.

NorCalQRP Northern California QRP Club

Meets 1st Sunday each month, contact Jim Cates 3241 Eastwood Rd.,
Sacramento, CA 95821.

Perham Foundation, contact Jerry Tucker WA6LNV 415-961-3266

SPECS Southern Peninsula Emergency Communication System

Meets each Monday 8:00PM on Net 145.27, 224.36, 440.80 MHz
contact Mike Hastings KB6LCJ, 408-243-6745 or 408-249-6909.

SCARES South County Amateur Radio Emergency Service

Meets 3rd Thursday 7:30 each month, San Carlos City Hall.
Net is on 144.45 & 444.50 (PL-100) 7:30 Monday evenings.
contact Dick Collins K6ANN 415-593-8952

Disaster Services, Palo Alto Chapter, American Red Cross

Meets 3rd Wed. each month 7:30PM, HF, packet, BBS, ATV, OSCAR
Gateway, NASA satellite,
contact Ruth Claypool 415-688-0423.

PACIFICON'97,

VE Exams, 3rd Saturday each month, 11AM

American Legion Hall, 651 El Camino Real, R.C.

The Board Minutes

(November 6, 1997, 7:30PM Board Meeting)

Present: Bill Rausch, AA6PA*, Pres

Dave Bailey, WS6W, Treas.

Vic Black, AB6SO, VPres.

Fred Canham, K6YT*

Kit Kohlmoos, K6ISO*

Steve Stuntz, K6FS*

Wally Porter, K6URO

*Board Member

Minutes: (of previous meeting) approved

Treasurer Report: see page 3

Old Business:

New Business:

(Due to illness Board Minutes are not reported this month.)

Join us for pre-meeting eyeball QSO



gab & gobble

6 pm— at Su Hong Restaurant
1039 El Camino Real, Menlo Park
—across from Kepler's Book Store—

Join Us At The Next
PAARA Meeting
January 3, 7:30

FI MFR

BY RICH REGENT K9GDF



ARNS

Palo Alto Amateur Radio Association, Inc.
PO Box 911
Menlo Park, CA 94026

President.....Vic Black, Jr., AB6SO.....(415) 366-0636
 Vice President.....Dave Meacham, W6EMD.....(415) 369 2633
 Secretary.....Dave Bailey, WS6W.....(408) 730-5215
 Corporate Secretary.....Kit Kohlmoos, W6ISO.....(415) 366 7813
 Treasurer.....Doug Schliebus, W6HXL.....(415) 851 0727
 Trustee/Property/Badges..Fred Canham, K6YT.....(415) 948-9238
 ARES Officer.....Lily Anne Hillis, N6PGM.....(415) 325-5484
 Club Historian.....Steve Stuntz, K6FS.....(415) 322-4952

Board of Directors

John Buonocore, KD6ZL (415) 366 1658 '97
 Fred Canham, K6YT (415) 948 9238 '97
 Charles Grandjean, WD6FAF '98
 Steve Stuntz, K6FS (415) 322 4952 '97

(see "Calendar" for Board meeting times, visitors welcome)

PAARAgaphs Staff

Editor.....Wally Porter, K6URO.....(415) 494 7038
 Database.....Bill McElhinney, KA6LZL.....(415) 325 9808
 e-mail Address: wmpor@aol.com

Congratulations

to our

1997 PAARA Officers

Vic Black -AB6SO.....President
 Dave Meacham -W6EMD... Vice President
 Dave Bailey -WS6W...Secretary
 Doug Schliebus -W6HXL..Treasure
 Kit Kohlmoos -W6ISO, Corporate Secretary
 Fred Canham -K6YT, Trustee/Property/Badges
 Lily Anne Hillis -N6PGM, ARES Officer
 Steve Stuntz -K6FS, Club Historian

Board Members

John Buonocore -KD6ZL.....Board Member thru '97
 Fred Canham -K6YT.....Board Member thru '97
 Steve Stuntz -K6SF.....Board Member thru '97
 Charles Grandjean -WD6FAF..Board Member thru '98

&

♥ Gratitude ♥

to our retiring

Board Members

Lily Anne Hillis, N6PGM
 Kit Kohlmoos, W6ISO
 Bill Smith, KE6CHQ
 Sy Stein, WA6ROM
 Rich Stiebel, W6APZ

TREASURER REPORT

Dave Bailey, WS6W

Revenues '96	OCT	NOV	DEC	1996 Total
Dues	6	12	0	600
Flea Market	0	0	0	6116.28
AMPEX Auction	3336.01	0	0	3336.01
Advertisements	0	0	0	600
Holiday Dinner	0	0	0	0
Raffle	0	0	0	81
Equipt. Sales				447.82
Total Revenues	3342.01	12	0	10652.29
Expenditures '96				
Stamps/Envelopes	0	0	0	64
DMV	0	0	0	43
State of CA	0	0	0	10
City of Menlo Park	0	0	0	300
Speaker's Dinner	0	22	0	132
Flea Market	800	0	0	1737.24
AMPEX Auction	0	0	0	200
Meeting Refreshments	10.43	0	0	92.38
PAARAgaphs	198.68	199.78	0	2271.93
Picnic	0	0	0	86.63
Field Day	0	300	0	376.39
Holiday Dinner	0	0	0	0
Amateur Radio Class				155.16
Misc.	313.25	106.94	0	747.85
Total Expenditures	522.36	628.72	0	6061.42



PAARA PRIDE

wear your

PAARA Badge

to

meetings, picnics, field days, winter parties, ham fests,
 flea markets, Pacificcons...
 (if you need one, contact Fred, K6YT)

Join Us At The Next PAARA Meeting

January 3, 1997

(Continued from page 1)Ponderings

publish it and credit you. These will get you started:

<http://www.sharkk.com> is the Web address for the "Spectrum Hogs' Amateur Repeater Koordinating Kouncil". It features an on-line repeater directory for No. California. The directory lists FM repeaters for 30, 50, 144, 220, 440 and 902 MHz, as well as 1.2 and 2.4 GHz. I was surprised to find a total of 55 repeaters on 1.2 and 3 repeaters on 2.4 GHz. There are also quite a few on the 902 MHz band. Print this file for a hard copy.

The free on line directory is more up-to-date than printed directories since it is maintained electronically. If you insist on becoming a member of the group you can join if you have a valid callsign and e-mail address. But, as the Alaska Airlines ads say, "It's gonna cost you". The membership fee is \$1 and annual dues are \$1. Thanks to non-PAARA member **KB6LUC, Tom Server**, for pointing me to this one.

Look at <http://exit109.com/~jimh/radio.shtml> to see great photos of transmitters from Voice of America, WWV, etc and some really BIG transmitting tubes. Take a virtual reality tour through an Eimac tube to see how it works. Thanks to **Mike Leland, KD6PIW**, for this one.

Go to <http://www.qrz.com/index.html> for the home page of QRZ Callsign Database. It will direct you to the other addresses available through this site.

AA7BQ, Fred Lloyd, edits the CD ROM ham callsign database QRZ! which is published by Walnut Creek CD ROM's. It allows searches sorted by callsign, name, address, city, state or ZIP code. It displays birthdate, issue and expiration dates for the current license, one former callsign and current license class. If you have provided the information, it will also display your e-mail address and digitized portrait and QSL card. The CD also contains many shareware and freeware ham radio programs.

The Web site (as opposed to the CD ROM) allows a search only by name or callsign without freeware and shareware programs. Input your ZIP code for a beam heading to the requested callsign. You can also update your e-mail address and send an electronic portrait or QSL card to share. Search callsigns at http://www.qrz.com/email_if.html. If the callsign has changed recently because of upgrades or new vanity callsigns, entering the former call will indicate the new callsign. Search by name at <http://www.qrz.com/cgi.bin/webname>.

The Web site offers a couple of other nifty services which are not available on CD. Bookmark <http://www.qrz.com/vanity.html> for new vanity callsigns. http://www.qrz.com/new_hams.html has a daily FCC report. You may never need to buy another Call Book or CD ROM and you won't need a CD drive.

Kenwood at Fry's

Kenwood is now selling ham gear through consumer distributors. The Brokaw Road, San Jose Fry's Electronics has the complete line on display. Prices promise to be competitive, but probably without HRO type ham support.

PROGRAM NOTES:



**PAARA Meeting,
December 6, 1996**

Steve Stuntz, K6FS

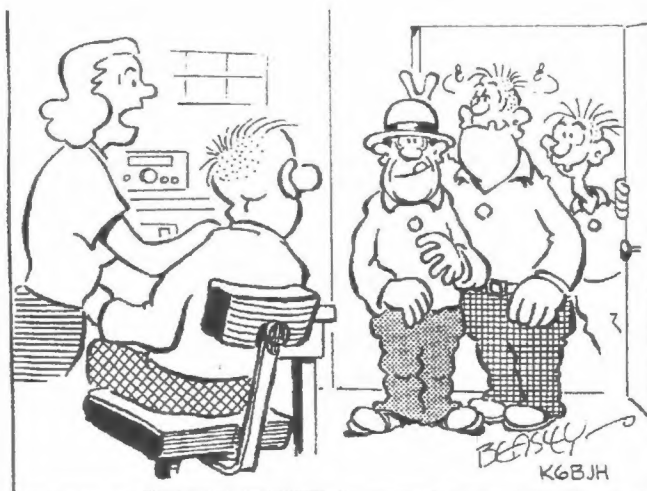
The program for PAARA's December was a double-barreled treat. **Tom Schiller, N6BT**, presented a show of color slides and commentary on the recent Dxpedition to Myanmar (formally Burma, prefix XY-XZ).

The expedition, spearheaded by the redoubtable **Marti Laine, OH2BH**, operated during November under the call **XZ1N**, all bands and modes, from the roof of a brand new hotel in the city of Rangoon. It had taken Marti and his chief cohort, **Kan, JAIBK**, almost two years to make the necessary arrangements, both diplomatic and technical, to get this project under way.

Since Myanmar is currently "governed" by a junta of generals now acting as a sort of cabinet, each carrying the equivalent of ministerial rank, the DX team found itself dealing with an array of officials not always knowledgeable or sympathetically disposed towards amateur radio. . . . Ham radio has been strictly forbidden to the native populace until very recently; more about that later.)

Tom pointed out that the initial - and most influential - contact between the Dxpedition planners and Myanmar officialdom was through the general designated as Minister of Tourism. Since Myanmar is making a strong bid to attract tourists (as well as overseas investors), the foreign DX-ers were accorded VIP courtesies throughout their two-week stay - so long as they permitted themselves to be escorted to scenes and sights of traditional interest. Tom emphasized

(Continued on page 5)Program Notes



I SEE YOU'VE BEEN WORKING GUYS ON YOUR DUMMY ANTENNA, AGAIN

(Continued from page 4) Program Notes

that they carefully avoided, in conversation and on carefully pre-arranged sight-seeing tours, references to the internal conflicts which have plagued Burma ever since the departure of Great Britain's colonial government and the assumption of "independence by a military-dominated, polylingual, multi-ethnic corner of the southeast Asian "Golden Triangle.

Fortunately for this operation, official arrangements were achieved with a reasonable lack of international friction, due in part to the lubricating effects of well-placed financial gratuities (for which read "bribes"). Relatively unrestricted access to the hotel roof expedited erection of some of Tom's best Force 12 products, despite temperatures - and accompanying humidity - requiring careful navigation across tarred roofs.

Despite physical discomforts inherent in a visit to an "emerging" tropical environment and attendant careful monitoring by government underlings, the expedition enjoyed much favorable attention, both locally and from the international ham community. Needless to say, the vagaries of propagation, especially at higher frequencies, complicated worldwide exchanges of signal reports. Tom noted particularly a phenomenon to DX-chasers and keepers of long-haul skeds: one way or "reciprocal" RF propagation, in which one of two widely-separated stations, of equal power and comparable antennas, can easily hear the other, but can hardly be heard by his opposite number. This puzzling experience was later confirmed in a landline QSO with **Warren Hill, ex-K7AY now K7WX**, of

(Continued on page 6) Program Notes



Winter Party

Thursday January 9

Fabbro's Restaurant

2915 El Camino Real

Redwood City

Happy Hour 6-7 PM

Dinner 7:00

PM

a choice of

• Fish • Prime Rib • Veal Marsala •

\$25 per person

wine and cider with the meal furnished by PAARA

PAARA MONDAY NIGHT NET

8:30 PM

145.230-600 MHz repeater

PL tone off

Latest news between monthly issues of PAARAgaph

From: Koert Koelman, kkoelman@ix.netcom.com

Subject: **BOOKS FOR SICK CHILDREN**

Houghton Mifflin Publishing Corporation will donate one book to a children's hospital for every 25 e-mails they receive. Please e-mail them at: share@hmco.com. I hope you can spare the seconds and let your friends know. So far they have only received 3,400 messages. Last year they reached 23,000.

Sincerely, Adam N. Bosnian, VP of Marketing -Consumer Sector, 508.970.0330 ext 112, abosnian@spacetec.com, www.spacetec.com, Sat Dec 14 14:07:58 1996

PAARAgaphs Ad Rates

PAARAgaphs accepts paid advertisements from non-members.

(short personal ads remain free for members in good standing).

All ad rates listed are per issue only.

1. Not for profit ads by association members for ham-related items and wants. No cost for business card size ads (additional space at \$2.50 per business card size).
2. For Profit organizations and/or individuals: \$5-business card size, \$25-half page, \$50 full page or back cover.

These fees may be reduced or waived in exchange for a valuable consideration that is given to the Association or its general membership. Such consideration must be in addition to any existing arrangements with the association.

The PAARAgaphs editors reserve the right to reject any ad deemed to be not in the best interest of the Association. All fees are for "scanner-ready" copy or text-only ads.

(Continued from page 5) Program Notes

Mesa, AZ. While extensively documented, it has yet to be explained to the satisfaction of us nonprofessionals, although **Bob Brown, NM7M**, Aanacortes, WA, formerly at UC Berkeley, advises there are acceptable, if complex, explanations available in the ionospheric literature (to which, by the way Bob has contributed significantly).

Guess us average types will have to just grin and take it as a fact of ham life!

Tom noted considerable variability in 30-meter WARC band contacts (CW and digital only), as additional evidence of "one-way" propagation. He also advanced the opinion that "that part of the world" (i.e., Burma/Myanmar, and by extension Southeast Asia) has the highest MUF of any place on the planet.

By projected 35-mm color slides (NOT handcam video!), Tom took us on a tour of tourist attractions, including ancient temples and palaces, after giving us detailed visual accounts of the several operating positions, and group-shots of the operating gang. In summing up, besides introducing it into an exotic part of the world until now inaccessible, the Dxpediton was successful, to a degree, in demonstrating the potential values of ham radio to a skeptical government: for the first time, a "native" station will be permitted on the air, although restricted at present to 20-meter SSTV only. According to **Warren, K7WX**, this is to be taken as a cautious positive gesture, since picture rather than voice will avoid language-barrier problem. Nothing was said about authorizing CW operation in the near future.

(Incidentally, **Dr. Hill, K7WX**, is writing an article about the 4 Myanmar Dxpediton, for submission to CQ Magazine ASAP. Stay tuned.)

To round out the evening, Tom presented the gist of his Pacificon '96 paper on antennas (remember - he's Mr. Force 12 himself) and transmission-line effects. In conjunction with his recent Myanmar experience, he noted that signals 1 to 2 dB above the levels of "noise" (i.e., QRM from stations calling) can be received; while this level of performance is typically achieved by increasing transmitter, Tom pointed out that by minimizing line-losses, including keeping feed-points clean and tight, operation is enhanced in two ways - attenuation of outgoing power is optimized, and the (voltage) strength of incoming signals is protected to the same extent. Illustration: 1000-watt transmitter output diminishes to 630 watts at the antenna, if delivered via a feedline with a 2dB loss; the "lost" power is simply warming the coax. Conversely, the 2dB loss also attenuates incoming signals, decreasing S/N at receiver output. Conclusion: if the station at the other end of the QSO has similar losses, then the "link loss" = 4dB. "That makes the difference between hearing and not hearing people" - word to the wise by **N6BT**.

Via overhead slide-projection Tom showed a table comparing several types of popular coax: RG-213 - 0.8 dB/100 ft. loss at 20 meters; RG-17 - 0.3 dB/100 ft., also at 20 meters;

RG-8x losses run significantly greater, especially at higher frequencies. He urged examining an re-doing connectors, if they have been in service for years; checking relay contacts in antenna - switchboxes were used - and, most importantly, keeping coax lengths to just what is needed (example: if your set-up requires 90 feet and you have a 200-foot supply, DON'T just coil up the excess; CUT IT TO LENGTH!). Also: check antenna mechanical joints for corrosion, and traps or elements for resonance. NOTE: if the SWR looks OK, the antenna might still not be performing as well as it should be.

"All the VSWR tells you is what the match is; it doesn't tell you if your antenna has any gain" (in the case of beams of course).

By way of innovation, Tom showed how he has improved, by measurement, the performance of a multi-element beam by adding another element without lengthening the boom: installing the added element approximately 1/10th wavelength above the present array. This is a feature being developed by his Force 12 company.

Tom concluded his talk with comments on indicated vs actual SWR's, losses due to mismatches up to 2-1, and comparing feedline materials: RG-8U foam, 9913 (1 whole dB less loss than foam line at 10 meters), and note the availability of a "superflex" 9913 which can be looped or rotated, a great improvement over the original 9913 "hardline" air-core material. RG-17 exhibits even less loss - at higher prices per foot (!). He noted in closing that 450-ohm ladder-line shows less loss, even at 10 meters, and in his words, "is terrific".

Suggested reading: Array of Light, Straight talk about Antennas and Related Information, booklet 2.002, by **T. H. Schiller**, available from Force 12 Antennas and Systems, 301 5-B Copper Road, Santa Clara, CA 95051, tel: (408) 720-9073, FAX (408) 720-9055.

Further suggested reading (about Burma): "Come to Hap- pyland: a visit to an anesthetized state", by Michael Pater- niti, OUTSIDE Magazine, December 1996, pp 64 ff. One reporter's observations of country and city life, behind scenes - what you don't see on a gilt-edged Dxpediton.

Also, check ARRL on WWW for a detailed story about the Dxpediton. Address. (more about the Dxpediton To The Union of Myanmar, check: The Central Arizona DX Association, XZ1N at: <http://www.getnet.com/~kf7ay/myanmar.html> ed.)



From ARRL Headquarters:

E-mail call sign database access:

Mark Downing, **WM7D**, says you now can access the call sign data in his database by sending a mes- sage to lookup@rdatasys.com. The body of the message should say "lookup callsign," where call- sign represents the call sign you wish to look up. The **WM7D** Web call sign server is at <http://www.rdatasys.com/>

(Continued on page 7) ARRL

(Continued from page 6)

~mdowning/fcc/callsign.html.

Listing stolen gear:

Mark Saunders, KJ7BS, offers a free service to help hams whose gear has been lost or stolen. Check out his lost or stolen ham gear listing on his Internet home page at <http://www.dancris.com/~tracker/tracker.html>.

Solar Flux, Sunspot Numbers on the Rise!

Solar prognosticator Tad Cook, KT7H, in Seattle, Washington reports: Solar activity is up again with the return of region 7999. Average flux was up this week by 13 points, the sunspot numbers up over 17 points, and A index up 1 point. Flux is expected to rise up to around 96 on December 23, then drop below 80 on December 31, then up to the mid-80s again around January 5 and 6. Expect the A and K indices to be up again around January 6, 11 and 12. Sunspot numbers for December 12 through 18 were 32, 31, 30, 25, 27, 38 and 33, respectively, with a mean of 30.9. The 10.7-cm flux was 81.1, 81.7, 82.5, 85, 86.2, 86.4 and 88.4, respectively, with a mean of 84.5. The planetary A indices for the same period were 8, 6, 5, 10, 10, 8, and 5, respectively, with a mean of 7.4.

Solar Cycle 23 Project: Stellar Conclusions

The Solar Cycle 23 Project--carried out by the NOAA Space Environment Center (SEC) with the support of the NASA Office of Space Science--predicts big things for Cycle 23! The panel, which met earlier this fall in Boulder, Colorado, found "reasonable consensus" for "a large solar cycle with a smoothed sunspot maximum of 160." The panel says this is comparable to the last two cycles, but won't exceed Cycle 19, "the largest cycle on record." "While the month of solar minimum is yet to be determined, recent low levels of activity imply that the minimum is at hand, and will occur during the final months of 1996," the panel found. "If so, Solar Cycle 23 will most likely peak in early 2000." The panel said geomagnetic activity during the cycle would be comparable to that experienced in recent cycles, resulting in annual average levels among the highest in the 128-year record, and the probability of severe geomagnetic storms "will be the greatest during an extended period lasting from 1999 through 2005." The goal of Solar Cycle 23 Project was to survey forecasts for the amplitude and phasing of the most common indicators of solar and geomagnetic activity and to recommend a forecast or group of forecasts for operational use. The Center recruited a scientific panel to assess prediction techniques and arrive at a reasoned consensus, including uncertainty, on how the solar cycle will develop. The panel of 12 scientists from 10 agencies included representatives from Australia, Germany, the United Kingdom, and the US.

Panel findings were authored by J. A. Joselyn, J. Anderson, H. Coffey, K. Harvey, D. Hathaway, G. Heckman, E. Hildner, W. Mende, K. Schatten, R. Thompson, A. W. P. Thomson, and O. R. White. See <http://proton.srl.noaa.gov:80/info/Cycle23.html> on the World Wide Web for a summary of the panel findings. A more detailed report will be available as a NOAA Technical Memorandum, and as an article in the open literature.

MORE BACK ISSUES OF QST ON CD-ROM AMONG NEW ARRL PRODUCTS

You don't need to keep a musty stack of back issues of QST in your basement anymore. The ARRL's QST View CD-ROM sets are now available! You can order 1990-94 or 1985-89--or both (\$39.95 each). QST View CD-ROM includes back issues of QST in convenient, space-saving CD-ROM format. Each page--all the ads, articles, columns and covers--has been scanned to provide a black-and-white image you can either read from your screen or print. Easy-to-use software included on the CD lets you search for articles by title and author, select specific year and issue, and browse individual articles or columns. Each three-disk set has an index to aid in finding the page or section of the issue you want to view or print. In addition, The ARRL Handbook CD 1.0, the electronic version of The 1997 ARRL Handbook for Radio Amateurs, now is available for immediate shipping. The ARRL Handbook CD 1.0 includes all the text, illustrations and software found in the printed version. Special features include versatile search capabilities to find the exact information you're looking for, audio simulations of a wide variety of Amateur Radio modes, and bookmarks that allow easy return to the topics you use most often. Pages or sections can be printed or saved to the clipboard for use in other Windows applications, plus zoom in and out capability allows you to see the drawings, photos and text enlarged or reduced. The ARRL Handbook CD 1.0 is \$49.95 plus \$4 shipping/handling. Shopping is simple with the ARRL online catalog. Just select the products you want by clicking on the "Add to shopping basket" links in the catalog. When you've selected everything you want, click on the catalog's "Finish order" link to complete your order. Other new products include The ARRL Antenna Compendium 5 (latest edition) and the brand-new Increasing Your Code Speed: 15 to 22 WPM audio CD!

Join Us At The Next PAARA Meeting

January 3, 1997

PAARA-Palo Alto Amateur Radio Association-P.O. Box 911, Menlo Park, California 94026-0911

Club meetings are on the first Friday of each month, 7:30pm at the Menlo Park Recreation Center, 700 Alma Street, Menlo Park, CA. • Radio NET every Monday evening, at 8:30pm, on the 145.230-600 MHz repeater, PL tone off. • Membership in PAARA is \$12.00 per calendar year which includes a subscription to PAARAgaphs. • Make payment to the Palo Alto Amateur Radio Association.

JANUARY

Palo Alto Amateur Radio Association, Inc.
PAARAgaphs Newsletter
P.O. Box 911
Menlo Park, California 94026



FIRST CLASS MAIL



Andy Korsak VE3FZK 96
504 Lakemead Way
Redwood City CA 94062-3919